

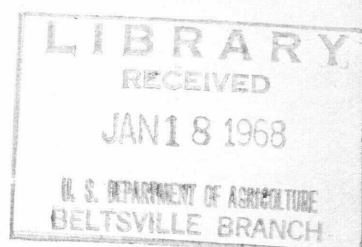
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The Farm Beef Herd



Farmers' Bulletin No. 2126
UNITED STATES DEPARTMENT OF AGRICULTURE

THE FARM BEEF HERD

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This Nation's growing population creates an ever expanding demand for beef. Today this demand is being met increasingly by beef cow herds located in farming areas.

These farm herds can be maintained successfully under a wide range of environmental conditions. They are now found in significant numbers in places outside the great western range areas, the traditional home of our beef breeding herds. The Southeast accounts for about one-fifth and the Far West about one-tenth of the Nation's total beef cows. Beef cows are being maintained on farms in all 50 States.

Management of a farm beef herd is complex, however, and the return on total capital invested may be low—even for a well run operation. As an example, 200-cow herds in northern Michigan in 1965 produced a return for labor ranging from \$2,990 to \$6,531 after allowing for all other costs, such as feed, interest on investment, taxes, etc. Part-time enterprises with 25 beef cows returned \$300 to \$1,200 net.

Whether the enterprise is supplementary or full-time, net returns will depend on location, cost of land, percentage of cows calving each year, weaning weight, crop yields, and prices received for cattle marketed. The beef cow herd seems best adapted to areas with an abundance of forages, where alternate enterprises are limited and land values are low.

Figures 1 and 2 illustrate some complexities of the farm beef herd operation. Figure 1 gives sample yearly variations in cattle prices; figure 2 shows in graph form a guide to prices needed to recover costs of calf production.

The demand today is for relatively young beef cattle weighing about 1,000 pounds alive. Your farm beef herd must help meet this need. It must also be tailored to your farm and to the feeds you produce or purchase.

Systems of Farm Beef Production

You can convert feeds produced on your farm into beef under a number of systems:

1. Beef breeding herd, from which all calves except necessary replacements are sold as feeders at weaning or at yearling ages. A variation of this system, more important in the South than elsewhere, is the sale of fat calves for slaughter at weaning.

2. Beef breeding herd, combined with feeding operation. All surplus young cattle are fattened on the farm where produced.

3. Feedlot operations using purchased feeder cattle.

4. Combination grazing and feeding operations using purchased feeder cattle.

The particular system of beef production that will suit your farm depends on:

- Type of farm. Should most of it be in pasture or forage production, or is it suitable for growing grain?

- Size of your farm.
- Available markets in your area.
- Your financial situation.
- Available help and what you must pay for it.

To be successful, the farm beef herd operation usually has:

- A relatively low investment in land required per cow.

- Maximum utilization of pasture and roughages.

- Minimum outlay for supplemental feed.

- Low labor costs.

- Large calf crops.

- Low incidence of disease and parasites.

To use your available feed to best advantage, you can vary your feeding plan by changing the ratio of concentrates to roughage. Table 1 gives estimates of the amounts of feed required per head for various production programs.

Cow herds are well adapted to farms that produce large amounts of pasture and harvested roughage but limited amounts of grains. Full

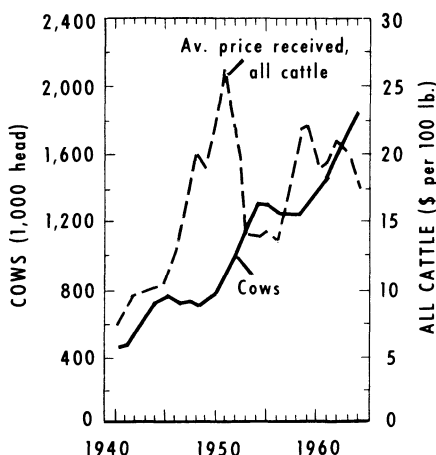


Figure 1.—Number of beef cows and cattle prices, 2 years old and older, in Oklahoma, 1940 to 1965.

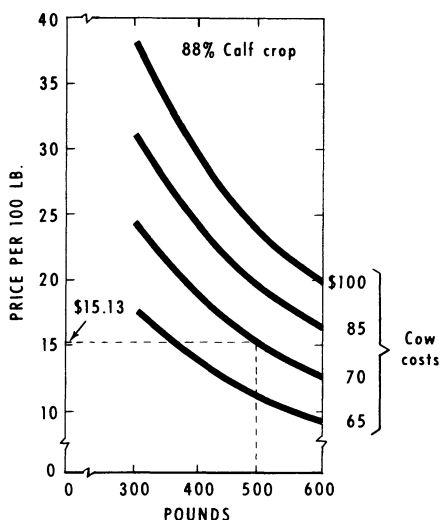


Figure 2.—Break-even prices in producing beef calves in Oklahoma. For example, with an 88 percent calf crop, cow costs at \$70 per year, and weaning weights of 500 pounds, the calf price needed to recover costs is \$15.13 per hundred pounds.

feeding in drylot, requires no pasture—only moderate amounts of harvested roughage and relatively large amounts of grain. Greater amounts of roughage may be used when deferred feeding of calves is the practice. Drylot full feeding, if it is to be successful, requires grain production on the farm or a local source of grain at reasonable prices.

Your farm may be best adapted to a system in which cattle are both raised and fattened. For example, part of your farm may be rough, broken, non-tillable land best suited for grazing cow herds. If your farm also has tillable land from which you can harvest grain and roughage, you may choose a system of fattening calves or yearlings. An alternative: Supplement cattle on pasture with concentrates to finish them for market.

Yearlings tend to finish less satisfactorily than 2-year-olds with this system because muscle and bone

Table 1.—*Approximate amount of feed required per head under various beef-production programs*¹

Program	Pasture	Average per day			Average per year per animal		
		Harvested roughage (hay equivalent)	Grain	Protein supplement	Harvested roughage (hay equivalent)	Grain	Protein supplement
	Days	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
1. 1,000-pound beef cow and calf to weaning (no creep):							
Pasture.....	215						
Winter lot, 150 days.....		20		1	3,000		150
2. Additional to creep-feed calf for 100 days.....			5			500	
3. Feeding steer calves from 450 to 950 pounds:							
Drylot, 215 days (average daily gain, 2.3 pounds).....		6	13	1.5	1,290	2,795	323
4. Feeding steer calves from 450 to 1,050 pounds:							
Winter, 150 days (average daily gain, 1.5 pounds).....		8	5	1	1,840	2,030	230
Pasture, 120 days (average daily gain, 1.5 pounds).....	120						
Drylot, 80 days (average daily gain, 2.5 pounds).....		8	16	1			
5. Feeding heifer calves from 400 to 750 pounds:							
Drylot, 175 days (average daily gain, 2.0 pounds).....		4	11	1	700	1,925	175
6. Feeding yearling steers from 700 to 1,050 pounds:							
Drylot, about 125 days (average daily gain, 2.75 pounds).....		7	15	1	875	1,875	125

¹ Amounts will differ in various sections of the Nation, particularly because of differences in length of grazing seasons.

growth occur before fattening. In addition, yearlings do not have as much digestive capacity as 2-year-olds for bulky, high moisture green grass.

Size of Herd and Expected Production

On most farms a beef herd is only one of several enterprises. Considerable flexibility, therefore, is possible in the size of the herd. It

should include at least 25 to 30 cows, a herd size that can be serviced by one bull. Small herds cost more per cow for bull service, and as a result, inferior bulls are often used—and calf quality is lower.

Partnership or community ownership of bulls or use of artificial insemination are means of decreasing the cost of bull service per cow. Artificial insemination is successful with beef cattle if the cows are observed carefully so that heat periods can be detected early and accurately. Beef bull semen is also used to in-

seminate dairy cows artificially when the progeny are to be raised for beef.

The profit you can expect from your beef herd depends largely on the percentage of cows that produce calves each year (percent calf crop). It is estimated that less than 85 percent of the Nation's beef cows produce calves each year. Properly managed farm herds should exceed this figure. A calf crop of 95 to 100 percent should be the aim, but even under good management a 90 percent crop is a reasonable average.

Weaning weights vary with the type of cattle and feed supplies, but if you are to make money, your calves should weigh an average of 500 to 550 pounds at 7½ to 8 months of age.

Selecting Breeding Stock

Any leading beef breed is satisfactory for farm beef production in areas where adapted. It is generally advisable to consult with owners of farm beef herds in your area or with your county agricultural agent before selecting a breed.

Crossbred calves tend to be more vigorous from birth, weigh more at

weaning, and grow more rapidly after weaning. This is called hybrid vigor (heterosis). You should study crossbreeding techniques if you plan to take advantage of this phenomenon.

For example, crosses between Brahman and British breeds in the Gulf Coast States, exhibit such hybrid vigor and produce carcasses equal to or only slightly inferior to those from British type cattle.

The value of Brahman breeding is particularly apparent in the ability of the cow to raise calves. If you live in the area from Florida to Texas where Brahman breeding is desirable, you can use a continued crossbreeding program on grades or purebreds of one of the new breeds based on Brahman-British crossbred foundations.

Crossbreeding is discussed in detail in Agriculture Information Bulletin No. 286, "Beef Cattle Breeding." See page 16 for information on how to obtain this publication.

Selecting breeding stock from within a breed or breeds is more important than selecting the breed itself—or the choice of a crossbreeding plan. Properly used, artificial insemination can be of great value in establishing your breeding herd.



Crossbred calves at the feeder in drylot.

BN-29113



Select a herd bull with a proven performance whenever possible.

ST-1865-8

Selecting Herd Sires

Your best buy in a herd sire may be an older bull proved to be a superior breeding animal on the basis of his progeny. Make sure he is free of reproductive disease, however. If this type of bull is not available, you may have to buy young untried bulls. Another way of obtaining use of outstanding bulls is through artificial insemination. This may be desirable if the service is available in your area and you can spend the time necessary to detect heat or estrus.

Performance testing records can be of value in selecting a herd sire. Such records are most meaningful when collected under conditions similar to those on your own farm. Contact your extension agent or your State experiment station for details.

It is preferable to use a bull at least 18 months old. Under pasture breeding conditions, bulls of this age and older usually will breed 25 to 30 cows satisfactorily in a 70- to 120-day breeding period. A bull 12 to 14 months of age can be hand-bred to 20 to 25 cows in a season

or can be allowed to breed smaller herds on pasture. But using bulls this age is risky, since fertility and breeding behavior tend to be uncertain.

Consider the following in selecting a young bull:

- He should be from a sire and dam with good fertility records. If possible, choose a bull from a sire and dam whose offspring have above average performance records (average daily gains, after weaning, of $2\frac{1}{4}$ pounds or more).

- He should have been raised by his own mother and weigh more than 500 pounds at weaning. This type of bull will have a good chance of transmitting satisfactory calf-raising ability to his daughters and thus contribute to the long-time improvement of the herd's performance.

- He should have exhibited good gaining ability after weaning and weigh 800 to 950 pounds at 12 to 14 months of age.

- He should be heavily muscled, of acceptable breed character, and his inherent skeletal size should be such that he can produce finished progeny at popular market weights of about 1050 to 1150 pounds.

● He should be disease free and from a herd with a good health history.

Selecting Females

You can use most of the same standards when buying females for your herd as when buying bulls, but you usually cannot be so selective.

Cull the cow herd on the basis of regularity of calving and weight and quality of calves produced. If a cow's first calf is poor, her later calves also are likely to be below average. You can cull cows effectively in the lower 10 to 25 percent of a herd on the basis of performance records of 1 or 2 of their calves. A cow that does not calve should, of course, be eliminated from the herd.

For replacements in an established herd, 20 to 40 percent of the heifers raised must be saved if herd numbers are to be kept up. The number kept in the herd depends on the percentage of calf crop, culling intensity among cows, and age at which cows are replaced. Select heifers that are heavily muscled, with heavy weaning weights and good rate of gain.

Keep performance records to help you cull older animals and select replacement animals intelligently. These records need not be elaborate but should include the following:

● Identification of each animal by means of ear tattoos, ear notches, brands, or neck straps.

● The parentage of each calf.

● The birth date of each calf.

● A weight taken at or near weaning to evaluate the dam's maternal ability.

A sample recording form is illustrated on page 8.

Cows should be culled on the basis of: (1) health and soundness, (2) fertility, (3) milk production as determined by calf weaning weights.

After weaning, all heifers should be fed and handled alike, to permit valid comparisons of rate of gain until 12 to 18 months of age. Steers should also all be fed alike, but may be fed differently from the heifers in order to finish them for market.

When buying herd sires or females from other herds, look for animals from herds where performance records are available. Because management practices and feed supplies have a great influence on the performance indicated in the records, do not rely solely on the absolute performance values shown. Instead, select animals with best records from outstanding herds.

Raising Replacement Breeding Animals

Good pasture is the best and usually the cheapest feed for developing replacement heifers following weaning. Heifers, however, are usually weaned in the fall and must be fed through the winter in drylot. Feeding during the first winter following weaning should be at a level that produces heifers large enough (600 pounds) to breed at 14 to 16 months of age and to calve at 2 years of age.

Rations that should support the necessary 1 to 1½ pounds per day gains are:

	<i>Pounds</i>
1. Corn or sorghum silage.....	25 to 30
Grain.....	3 to 5
Protein supplement.....	1
2. Legume or mixed hay.....	12 to 15
Grain.....	3 to 5
3. Corn or sorghum silage.....	20 to 25
Legume hay.....	3 to 4
Grain.....	3 to 5
4. High-quality grass hay.....	12 to 15
Grain.....	3 to 5
Protein supplement.....	1

These heifers will require similar rations during their second winter, just before calving.

You can winter heifers more cheaply on permanent pasture in

Bulls usually should be fed rather liberally from weaning to 12 to 14

months of age. This promotes rapid development and earlier breeding use. Liberal rations during this period also give a bull an opportunity to show his inherent ability to gain, fatten, and develop muscle. And these inherent characteristics

COW PERFORMANCE RECORD

Date Born _____

Cow Number _____

Individual Weight and Grade Record

Weaning Weight _____ W/DA _____ Grade _____

Yearling Weight _____ Grade _____

First Bred Weight _____ Mature Weight _____

Health and Management Record

Date	Vaccinated For	Blood Tested

Dam _____ Sire _____

Date Sold or Died	Price
-------------------	-------

Color or Breed Description or Remarks

Record of Offspring

[illegible]

Sample form for recording cow performance. (Courtesy of *The Progressive Farmer*)

are related to the potential performing ability of his progeny. Selecting and using bulls with above-average performance during this period should lead to improved herd performance.

Feeding and Caring for Herd Sires

A young bull should always be fed so as to make good growth and reach normal size. A young bull makes more rapid gains than a heifer and consequently needs more nutrients. How much more depends on his size and age and how heavily you use him after he has matured.

Fertility likely will be best among bulls that are kept in medium flesh and that exercise at will. Too much fat wastes feed and money and may result in poor fertility. Bulls that are too thin may also have breeding difficulties. If your herd is large enough for two bulls, rotating bulls during the breeding season is desirable.

During the grazing season, good pasture will provide most of the bull's nutritional needs. Young growing bulls, however, usually need some supplementary grain to keep in satisfactory flesh. If used on a seasonal basis, most bulls are likely to lose 50 to 100 pounds during the breeding season. They must regain this weight during the remainder of the year.

Older bulls normally will maintain desirable condition on good pasture in summer and roughage in winter. To provide enough carotene, which the animal converts to vitamin A, at least half of the roughage fed (dry basis) should be good legume hay or corn, sorghum, or grass silage. If none of the roughage is legume, older bulls should be fed 1 to 2 pounds daily of a high-protein supplement.

Frequently, some grain is fed for 30 to 60 days before the breeding season—and during the breeding

season when this is possible—to improve breeding performance. One pound of protein supplement and 5 pounds of grain daily should be ample for most bulls. The condition of the bull governs the amount of feed offered.

Do not allow the herd sire to run with the cows the whole year. If possible, keep him in a separate enclosure during the nonbreeding season. If you cannot pasture him alone after the breeding season, graze him with steers or pregnant cows.

A bull in good breeding condition is likely to be temperamental. Always handle him with care.

The fence around the lot or corral where you keep the bull should not obstruct his view of other cattle, but it should be securely constructed. As an added safety factor, install a battery-operated "charged-wire" device on the inside of the fence enclosing the lot or corral. Find the best location for the wire by trial. A height of about 2 feet is suggested.

Feeding and Caring for the Cow Herd

Feed required for maintenance is roughly proportional to live weight. Beef cows must be fed as much low-cost roughage and by-product feeds as possible—if they are to compete successfully with other classes of livestock.

In all beef-cow herd operations the level of nutrition should be adequate to keep the cows in good flesh. Feeding above this level will increase expense without a commensurate increase in production. Keeping cows too fat will increase calving difficulties and calf losses, and decrease milk flow. Undue limitations on feed quality and quantity will reduce productivity—particularly the percentage of calf crop—and thus reduce net income.

Pastures are the natural feed for beef cattle, and cows on good pas-

ture ordinarily will need no supplemental feed. Some cattlemen think that beef cows on extremely succulent pasture early in the spring benefit if they are fed some hay or other dry roughage.

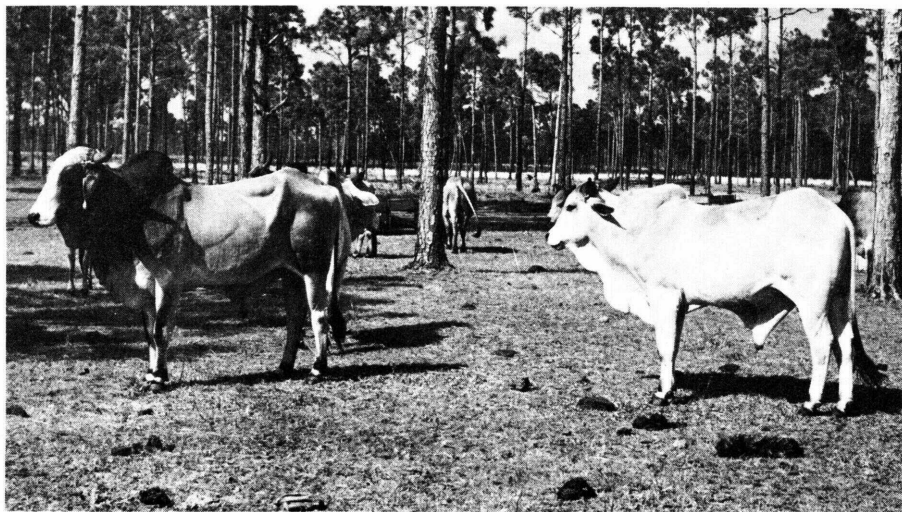
If pastures are short because of drought or overgrazing, supplement with hay, silage, green corn, or other roughage at levels sufficient to maintain the cows in good condition.

If you wean your calves in the fall, you may be able to maintain your beef-cow herd well into the winter on meadow or on residues after small grain harvest, on stalk fields after corn has been harvested, or on permanent pasture where grass has been allowed to accumulate during the late summer. They can get most of their roughage from such material—feed that might otherwise be wasted. Since



Hereford cows grazing improved Bermudagrass pasture.

BN-15752



Brahman cattle grazing in southeastern United States.

BN-29112

this roughage is usually high in fiber and low in protein, you may need to feed about 1 pound of protein concentrate per head daily.

Start winter feeding when pasture conditions demand it and before the cows lose much weight. Supply feed in small amounts at first and increase as necessary. Usually, feed the poorest hay or silage first and save the best roughage for late winter and the calving season. In many climates you can feed your herd on permanent pasture sod, which reduces cleaning and manure-hauling time during the busy spring season.

Feed cows, yearlings, and calves separately. Divide cows into small groups for winter feeding so that the "bossy" cows are not confined with timid ones.

Rations for dry beef cows can vary widely because they depend on the feed available. You can meet a cow's daily requirements for vitamin A by feeding about 5 pounds of green-colored hay or 15 or more pounds of silage preserved so that its green color is well maintained.

A succulent feed is desirable but not essential in the ration of the dry beef cow. Corn, sorghum, and various types of grass silage are excellent. So are root crops, but they are not used much because of the labor needed to grow and harvest them.

To maintain weight, a beef cow needs about 2 pounds of dry matter daily per 100 pounds of live weight. Much of this can be straw, low-quality grass hay, corn stover, ground corncocks, cottonseed hulls, and similar materials. Feed good-quality hay or silage in limited amounts. Otherwise, a cow will eat more than she needs and unduly increase feed costs.

Here are some examples of suitable daily rations for dry, pregnant cows weighing about 1,000 pounds:

	<i>Pounds</i>
1. Legume or mixed grass-legume hay.....	16 to 25
2. Legume hay.....	5 to 10
Straw or low-quality grass hay...	10 to 15
3. Corn or sorghum silage.....	30
Legume hay.....	5
Straw, low-quality grass hay, cottonseed hulls, ground corncocks, or other low-quality roughage.....	Unlimited
4. Cereal straw.....	Unlimited
5. Corn or sorghum silage.....	40 to 50
Protein supplement.....	1
6. Prairie or grass hay.....	Unlimited
Protein supplement.....	0.5 to 1.0
7. Grass silage.....	30 to 40
Straw or low-quality grass hay...	Unlimited

There has been some interest in wintering cows or heifers entirely on such low-quality roughage as ground corncocks or cottonseed hulls plus 2 to 3½ pounds daily of a highly fortified protein supplement.

Here are examples of highly fortified protein supplements:

Purdue Supplement A (Revised)

	<i>Pounds</i>
Soybean meal.....	650.5
Cane molasses.....	140.0
Dehydrated alfalfa meal.....	140.0
Bonemeal.....	52.0
Cobaltized salt.....	17.0
Vitamin A and D concentrate.....	0.5
	<hr/> 1,000.0

Oklahoma Supplement ¹

	<i>Pounds</i>
Soybean meal.....	650
Dehydrated alfalfa meal.....	250
Molasses.....	100
Calcium carbonate.....	25
	<hr/> 1,025

Iowa Supplement

	<i>Pounds</i>
Soybean meal.....	415
Cane molasses.....	230
Dehydrated alfalfa.....	225
Urea.....	50
Dicalcium phosphate.....	30
Dried torula yeast.....	50
	<hr/> 1,000

¹In addition to items listed, includes 2 grams of trace minerals and 21,000 USP units of dry stabilized vitamin A per head daily.

A ration of 14.5 pounds of ground cobs, 3.5 pounds of a fortified protein supplement, and 1 pound of ground alfalfa has proved satisfactory for wintering pregnant cows. Feed prices and availability determine whether you should use rations of this general type.

Some of the protein supplements contain non-protein nitrogen (urea) and may be used with rations containing appreciable amounts of grain. When feeding high roughage rations, however, these supplements should be used with care.

Unless your hay or silage is of very good quality, concentrates must be fed to support milk flow from cows that calve in the fall and nurse during the winter. Add 3 to 5 pounds of a 16-percent protein concentrate mixture to any of the rations listed.

Cows that calve before spring pasture is available should be fed more liberally as soon as their calves are large enough to benefit from an increased milk flow.

Except in the Gulf Coast States most of the perennial summer pasture grasses used for permanent pastures are dormant and have low nutritional value during the winter. If you use them for grazing during winter, feed a protein and mineral supplement. It is usually more economical to feed harvested forage during the winter, except in the most extreme southern areas.

In much of the South, well-fertilized temporary crops—rye, oats, ryegrass, or mixtures of these with crimson clover—will furnish grazing during the winter months. These crops are expensive to produce, however. Production varies greatly, depending on the severity of the winter, moisture conditions, and whether the crop is seeded in a specially-prepared seed bed or inter-seeded in permanent pasture sods.

In addition, when beef cows have unlimited access to pastures, these temporary winter crops usually fur-

nish better grazing than is needed. Cows fatten excessively, even when they are nursing calves. Temporary pastures can be economical and highly satisfactory, however, if cows are grazed for limited periods of 2 to 4 hours daily and fed harvested roughage for the remainder of the daily ration.

Caring for Cow at Calving

The gestation period of the cow is about 283 days, or about 9½ months. A variation of as much as 10 days either way from the average gestation length is not unusual.

As calving approaches, the udder becomes distended with milk and there is a marked "loosening" or falling away in the region of the tailhead and pinbones. The vulva swells and enlarges considerably.

When cows calve during the grazing season, a clean pasture is better than a barn, primarily because there is less chance of infection and injury. As cows near calving time, you can confine them in a small pasture near the farmhouse, where they can be frequently observed. If this is not possible, check the pasture at least twice daily during the calving season.

If you expect a cow to calve during severe weather, put her in a clean, well-ventilated box stall that has been disinfected, or confine her in a small pasture having underbrush or protected shelter.

Cows in large herds normally calve without any change in ration. Cows getting only high-quality dry roughage usually get along well at calving time. However, some cattlemen like to incorporate mildly laxative feeds into the ration as calving approaches.

Most cows will calve normally without assistance. Be alert for signs of trouble and assist, or call trained help if needed. If the cow has severe labor and no results for more than 1 to 2 hours, assistance usually is needed.

Once a calf is born, if it does not begin breathing immediately, wipe out any mucus in its mouth or nostrils. Induce natural breathing by alternate compression and relaxation of the walls of the chest.

Protect the calf in cold weather and keep it warm until it is dry and on its feet. Disinfect the navel of the newborn calf with iodine as a precaution against navel infection.

Even though a cow may have more milk than the calf can take the first few days, she quickly adjusts her milk output to a level the calf can take. Failure to remove excess milk does not increase the frequency of spoiled udders.

Age at Which to Breed Heifers

Under good management conditions heifers should be bred to calve as 2-year-olds. This procedure is encouraged (1) if heifers can be grown rapidly and weigh 600 pounds or more at breeding, and (2) if experienced help is available at calving time to give special attention to the heifers.

Research has shown that heifers bred to calve first as 2-year-olds will raise 0.7 more calves during their lives than heifers bred to calve first as 3-year-olds. The earlier breeding has little if any effect on size of the heifer at maturity and apparently does not reduce length of productive life. Heifers calving at 2 years often require help, however, and calf losses may be higher than average. Since crossbred calves show a higher rate of survival, crossbreeding of heifers might be considered for first calving.

Heifers should be bred before the rest of the cow herd, to insure a better chance of conception and to allow more attention at calving time. Young cows will need extra feed after calving to support continued growth during lactation. If possible,

young cows should be separated from older ones. All cows should be gaining weight at the start of the breeding season.

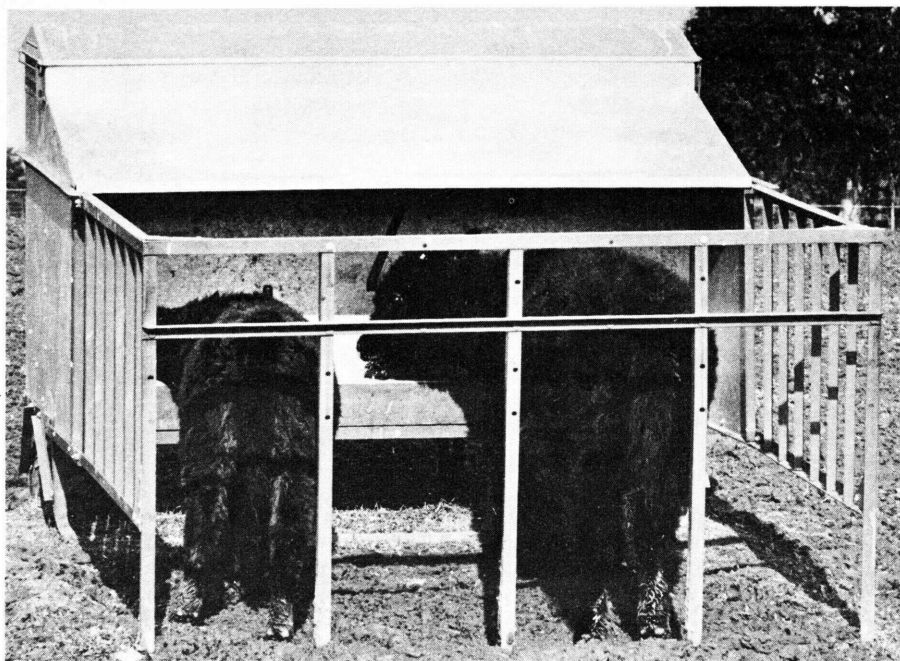
Seasonal Calving

In many farm beef herds, the bull is allowed to run with the cow herd throughout the year. This system may result in more calves being raised over a period of years; but if your herd is small, it is usually better to limit breeding to a season of 2 to 4 months. By so doing, you can choose the most favorable season for calving in your area. And since calves are nearly the same age, you can follow more uniform and systematic management practices.

Systematic calving during two seasons a year may be desirable if you have a large herd. This may increase calving slightly in large herds, since cows failing to settle in one season can be bred in the next. You can breed heifers to calve first at about 2½ years of age under this system, which may be preferable to breeding for calving at either 2 or 3 years of age.

Most beef calves are dropped in the spring. If climate permits, they should arrive 6 weeks to 3 months before pasture season begins. This way the calf will be large enough to use the increased milk flow when the dam goes to pasture. It is usually necessary to wean calves at the end of the pasture season in the fall. Therefore, having them born fairly early in the spring results in older, heavier, and more valuable calves at weaning.

Fall calving requires more harvested feed for the cow herd. In the North, fall calves seldom do as well as calves born in the spring; fall calving, therefore, is justified only under special circumstances. Local circumstances and feed supplies, however, should determine the time of the breeding season.



Angus calves at the creep feeder.

ST-1868-23

Creep Feeding Calves

Creep feeding (providing concentrates to nursing calves in enclosures that their dams cannot enter), normally begins when calves are 80 to 90 days old. The practice usually increases gains and the amount of finish carried at weaning. Calves have access to a concentrate mixture in an enclosure placed in the pasture where shade and water are available and where cows gather.

Whether creep feeding will be profitable for you depends on your system of management and, to some extent, on the milk-producing ability of the dams. Calves from dams with good milk-producing ability get little benefit from creep feeding. Creep feeding is often necessary in drought years when feed supplies for cows are short and their milk production is reduced.

Since milk furnishes an adequate amount of protein to nursing calves,

grain alone makes a satisfactory creep feed. Feed whole, cracked, or coarsely ground grain. Often, adding a small proportion of protein supplement (1 part of supplement to 6 to 9 parts of coarsely ground grain) will improve palatability. Calves eat about 500 pounds of feed, if they have free access to creeps, from the time they are about 90 days old until they are weaned. The amount eaten varies greatly from herd to herd, however.

Creep feeding often will pay (1) in purebred herds where calves that exhibit special finish at weaning may have advertising value, (2) in commercial herds when the calves are to be marketed at or soon after weaning as fat calves, and (3) during drought or other emergency.

Creep feeding ordinarily will not pay if calves are to be carried through a winter on limited rations prior to grazing for one or more seasons before marketing.

Weaning Calves

Wean calves that have been running with their dams on pasture by taking them away from the cows and confining them in a pen or barn out of sight of their dams and other cattle. Preferably, they should be out of hearing range of their dams, but this is difficult on most small farms. Offer the calves some good hay and a small amount of grain during this period. Unless they have been creep fed, they will eat little for a few days.

The safest and most effective method of drying off cows is to stop milking them. The pressure built up stops further secretion. Both the dam and the calf probably are better off if the calf is taken away and not put back with the cow.

Dehorning and Castrating

In commercial herds, and often in purebred herds, it is advisable to dehorn calves of horned breeds. This can be done most easily before the calves are 3 weeks old, when the tender horn "buttons" first appear. Scrape them with a knife to irritate the surface, then carefully apply the slightly moist tip of a caustic pencil (stick of potassium hydroxide). The caustic causes a scab to form on the irritated area. After a few days, the scab shrivels and falls off, leaving a hornless or "polled" head.

Commercial liquid and paste preparations may be easier for you to use than the caustic sticks, or you may prefer to apply a heated iron to the base of the horn button. Electrically heated irons are convenient and satisfactory for use on many farms.

Male calves must be castrated to produce beef that meets American market requirements. The operation is best performed at a time of year when flies are not prevalent and before the calves are 3 to 4 months old. Some cattlemen castrate calves at birth.

Spaying of heifers seldom is practiced in farm herds. Contrary to former belief, spayed heifers actually make slower gains and have no carcass superiority. Heifers should be spayed only on farms where they are being fattened and it is impossible to keep them separated from bulls.

Detailed instructions may be obtained in Farmers' Bulletin No. 2141, "Dehorning, Castrating, Branding, and Marking." See page 16 for information on how to obtain this publication.

Salt and Other Mineral Requirements

Supply stock at all times with clean, fresh water and loose or block salt. On the average, cattle will consume about 2 pounds of salt per head a month—less for calves and more for steers on full feed and for mature cows.

Requirements of cattle for other minerals vary from area to area and with the type of ration. Consult your county agricultural agent about probable needs in your area.

Iodine is deficient in some parts of the country. Such deficiency leads to goiter or "big neck" in newborn calves. In these areas iodized salt should be fed.

Cobalt, copper, iron, and possibly other trace minerals are known to be deficient in some areas. These should be supplied. Your county agricultural agent can furnish the proper information.

Calcium often will be needed if beef cattle are not fed legumes or if the pasture is low in calcium. Phosphorus is deficient in the soil in many areas. Plants grown on these soils also are low in this element. Low-quality roughage and mature, weathered hay and grasses that are low in protein and carotene also are likely to be low in phosphorus.

Ground limestone usually is the cheapest calcium supplement. Phosphorus may be supplied in the form

of steamed bonemeal, dicalcium phosphate, or defluorinated phosphates. Supplements should be fed as required in specific localities. Both calcium and phosphorus supplements usually are fed in mixtures with salt.

Feeding Cattle for Market

Many farmers with beef herds find it pays to fatten the calves they raise. The system they follow may be immediate full-feeding on high-concentrate rations.

An increasingly popular system of handling farm-raised steers, however, is to winter them at moderate nutritional levels the first winter, graze them a season, and then full-feed them for 60 to 100 days just prior to marketing. This permits marketing 18- to 20-month-old steers at approximately 1,000 pounds, graded in the high-good to low-choice range.

Information on finishing is available in Farmers' Bulletin No. 2196, "Finishing Beef Cattle." See instructions on how to order this publication in the section headed "Additional Information" below.

Heifers can be handled under either system, but ordinarily they should be marketed at lighter weights than steers, since the heifers fatten more rapidly.

Controlling Diseases and Parasites

Maintenance of animal health is a prerequisite to profitable beef production. Numerous U.S. Department of Agriculture bulletins on control and prevention of specific diseases and on control of internal and external parasites are available. Write to the Department for bulletins or ask your county agricultural agent for help.

Additional Information

USDA Bulletins listed below are available at the listed prices from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Be sure to include your full address and ZIP Code when ordering.

Agriculture Information Bulletin No. 286, "Beef Cattle Breeding." 25¢.

Farmers' Bulletin No. 2141, "Dehorning, Castrating, Branding, and Marking." 10¢.

Farmers' Bulletin No. 2196, "Finishing Beef Cattle." 15¢.

Farmers' Bulletin No. 1584, "Feedlot and Ranch Equipment for Beef Cattle." 10¢.

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